

4. *The Cephalopoda of the South African Museum.*—By ANNE
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(With Plates XVII and XVIII.)

EDITOR'S NOTE.

[THE collection which forms the basis of this report was made by the Cape Government trawler, s.s. "Pieter Faure." When the "Pieter Faure" collections came into the possession of the South African Museum, the Cephalopods were despatched to Dr. Hoyle in 1910 for report. Owing to pressure of other work, Dr. Hoyle was continually prevented from undertaking the examination of the material, and in 1923 handed it over to Dr. Simpson.

Dr. Robson of the British Museum then suggested that Miss Massy, who was then at work on other collections from South African waters, should undertake to write the report on our material, and with Dr. Simpson's concurrence this has been done.

A condition attached to this suggestion was that a first set should be presented to the British Museum. In view of the long time that had elapsed since the collection was made and the desirability of avoiding further delay, and also possibly further transport of the material to another specialist, this condition was accepted. The types of the new species and a set of the specimens are therefore in the British Museum.

A few specimens derived from other sources have been added to the "Pieter Faure" collection and are reported upon in the following pages.—EDITOR.]

THIS collection consists of 95 specimens belonging to 11 genera and 16 species.

There are also a few examples which are in too bad condition or too juvenile to be specifically assigned. Two new species of *Sepia* and another of somewhat peculiar form which is provisionally distinguished by a letter occur.

The area explored extends from Hout Bay, near Cape Town, on the south-west coast to Delagoa Bay on the south-east. Twenty-three

hauls were made in shallow water to about 50 fathoms and resulted in catches of *Loligo*, *Iniotenthis*, and *Sepia*. Eight deep-water hauls from 84–600 fathoms caught *Bathypolypus*, *Rossia*, and *Sepia*. The examples of *Iniotenthis* are referred to *I. japonica*, Verrill, a species which has not previously been recorded, except from India and Japan. Another eastern species is *Loligo indica*, Pfeffer. *Polypus granulatus* (Lam.), which ranges from the Indian Ocean round the Cape to the Azores, is represented by two specimens. A very young example of *Todaropsis eblanae* (Ball) occurred in the Cape Town area. The remaining 11 species appear to be peculiar to South Africa.

I am indebted to the Director of the South African Museum for permission to work out the collection.

The drawings have been done by Miss E. Barnes of the Dublin Museum.

List of Species obtained.

- Moroteuthis* sp. A, Robson.
Todaropsis eblanae (Ball).
Rossia enigmatica, Robson.
Iniotenthis japonica, Verrill.
Iniotenthis sp.
Loligo indica, Pfeffer.
Loligo reynaudi, d'Orb.
Loligo B, Robson.
Acanthosepion vermiculata (Q. et G.).
Rhombosepion australis (Q. et G.).
 „ *hieronis*, Robson.
 „ *robsoni*, sp. nov.
Rhombosepion sp. A.
Doratosepion joubini, sp. nov.
Sepia sp.
Hemisepius typicus, Stn.
Bathypolypus valdiviae (Chun).
Polypus granulatus (Lam.).
Polypus sp.

FAMILY ONYCHOTEUTHIDAE.

Moroteuthis sp. A.

W. of Dassen Island, 250 f. One.

Photographs of a cast of the actual specimen have been sent to me. As in the specimen recorded from Cape Town (Robson, 1924, p. 595), the mantle is 5 times as long as its breadth, and the posterior end of fin is much attenuated. The length of the fin in proportion to the

mantle-length is about 58 per cent. The breadth of the fin expressed as a percentage of the mantle-length is about 45 per cent.

The peculiar elevations covering the mantle are clearly shown in the photograph.

Distribution.—Cape Town, 135 f., one adult (♀) (Robson, 1924).

DIVISION OEGOPSIDA.

FAMILY OMMATOSTREPHIDAE.

Subfamily ILLICINAE.

Todaropsis eblanae (Ball), 1841.

P.F. 466. Lat. 34° 43' 15" S. Long. 18° 30' 00" E., shrimp trawl, 123 f., green mud. One.

This is a very young example with a mantle-length of 40 mm., and the skin of the head is not yet developed so as to cover a considerable portion of the eyes as in larger examples. In an Irish specimen with mantle-length of 82 mm., the eye has a diameter of 19 mm., and is so sheathed by the skin that only an opening of 7×9 mm. is left, instead of the eye being quite free and uncovered as in the present individual.

Distribution.—North Sea, Ireland, Plymouth, Spain, Portugal, Mediterranean, South Africa (Robson, 1924).

MYOPSIDA.

FAMILY SEPIOLIDAE.

Rossia enigmatica, Robson, 1924.

P.F. 16,644. Cape Point Lighthouse, N.E. $\frac{3}{4}$ E., 29 m., shrimp trawl, 470 f., greensand. One ♀.

This specimen has a dorsal mantle-length of 30 mm., and the nidamental glands measure 7 mm. in length. Some suckers of the 2nd pair of arms are the largest and measure about 2 mm. in diameter, and their ring is about $\frac{1}{3}$ the diameter of a whole sucker. The tentacular suckers have 5 rows of plates. The fins commence at 7 mm. from the anterior margin of the mantle and are 20 mm. in length by about 15 mm. in width.

Distribution.—Cape Town, 220 f., and Cape, 151 f. (Robson, 1924).

Iniotuthis japonica, Verrill, 1881.

P.F. 2255. Lion's Head, N. 78 E., 12 m., shrimp trawl, 60 f., sand and small black specks. One ♂.

P.F. 7063. Sebastian Bluff, N.W. $\frac{3}{4}$ W., $8\frac{1}{2}$ m., shrimp trawl, 34 f., mud. One ♂.

P.F. 7054. Sebastian Bluff, N.W. by W. $\frac{1}{4}$ W., $8\frac{1}{2}$ m., shrimp trawl, 34 f., mud. One ♀.

P.F. 15,343. Struys Point, N. by W. $\frac{1}{2}$ W., $7\frac{1}{2}$ m., shrimp trawl, 42 f., green mud. One ♀.

In both the males the chromatophores are much larger and more abundant and resemble those of *I. maculosa*, Goodrich. The width of the nuchal commissure is, however, less than the length of the fin at insertion. In specimens of *I. maculosa* from the Orissa coast and from Burma which I have examined, these measurements are about equal. The specimen No. 32 (dorsal mantle, 10 mm.) has the spermatophore filled with amber-coloured sperms, each of which measures about 3 mm. in length.

Distribution.—Japan (type), Andaman Islands (Massy, 1916).

Invioteuthis sp.

P.F. 6068. Outside Sebastian Bay, Cape Infanta, N.E. $\frac{3}{4}$ N., $4\frac{1}{2}$ m., shrimp trawl, 37 f., mud. (?) Two juv., mantle 2·50 mm.

P.F. 10,506. Cape St. Blaize, N.E. $\frac{1}{2}$ N., $8\frac{1}{4}$ m., tow net. Two juv., mantle, 1·2 mm.

FAMILY LOLIGINIDAE.

Loligo indica, Pfeffer, 1884.

P.F. 10,403. Gericke Point, N. by E. $\frac{1}{4}$ E., 5 m., shrimp trawl, 35 f., fine sand. Four ♂, one ♀.

P.F. 7062. Sebastian Bluff, N.W. $\frac{3}{4}$ W., $8\frac{1}{2}$ m., shrimp trawl, 34 f., mud. Two ♂, two ♀.

P.F. 2283. Mouth of Hout Bay, shrimp trawl, 40–50 f., fine sand. One ♀.

P.F. 10,269. Sebastian Bluff, N.W. by W. $\frac{1}{4}$ W., $8\frac{1}{2}$ m., shrimp trawl, 34 f., mud. One ♀.

P.F. 2273. Hout Bay, shrimp trawl, 9–20 f., fine sand and brackish shingle. One ♀.

Agulhas Bank, July 1922. Two ♂, one ♀ (K. H. Barnard).

The specimens from Agulhas Bank are the largest of the above, the males having a mantle-length of 83–90 mm. and the female 114 mm. Goodrich (1896, pl. ii, figs. 20 and 26) found that in the specimens which he referred to this species, the teeth surrounded the rings of the arm

suckers in the male, but were more clearly defined on the distal border, and in the female they were limited to the distal $\frac{1}{2}$, the rest of the ring being smooth.

The Agulhas Bank specimens agree in this as far as examined. In both sexes the teeth are present on half the ring in the small tentacular suckers as found by Goodrich (*op. cit.*, pl. ii, fig. 24). The examples from the 5 other stations are all smooth, the largest having a mantle-length of 38 mm. They have clusters of dark chromatophores on the back of the head which bear a superficial resemblance to eyes.

This species has not previously been recorded from the Cape Town area.

Distribution.—Java (type), South of Papua ("Challenger"), India, South Africa (Robson, 1924; Massy, 1925).

Loligo reynaudi, d'Orb, 1845.

P.F. 529. Algoa Bay. Lat. $33^{\circ} 52'$ S. Long. $25^{\circ} 48'$ E., shrimp trawl, 22 f. One ♀.

P.F. 104. Off Sebastian Bay, Cape Infanta, E. by N. $\frac{3}{4}$ N., $4\frac{3}{4}$ m., shrimp trawl, 35 f., mud. (?) Two young.

The specimens to which a query is affixed measure 17–27 mm. in mantle-length and are not in good condition. Both have the median suckers of the club much larger than the rest, but all the suckers have teeth on the rings, whereas in the largest specimen (P.F. 529) the largest rings are smooth. The largest of the young specimens have 2 large red dots on the back of the head just where clusters of chromatophores are present in young *Loligo indica*, Pfeffer.

Distribution.—South Africa.

Loligo B, Robson, 1924.

P.F. 11,741. Tugela River mouth, N.W. by N. $\frac{3}{4}$ N., $15\frac{1}{2}$ m., shrimp trawl, 36–42 f., mud. (?) One ♀.

This has a mantle-length of 32 mm. and is evidently a different species from *Loligo indica*, Pfeffer, having relatively smaller suckers and paler colouring, and the arm rings instead of having broad square teeth have narrow-pointed teeth, sometimes with small teeth in between as in Robson's species (1924, text-fig. 29, 2, p. 653). The tentacle rings have long pointed teeth. There are no clusters of dark chromatophores on the back of the head. The mantle is not narrower in proportion than that of *L. indica*.

Distribution.—Natal Coast.

FAMILY SEPIIDAE.

Acanthosepion vermiculata (Q. et G., 1832.)

East London shore. Wood, April 14, 1900. One ♀. [63.]

Zwart Kops. April 4, 1897. One ♂. [64.]

Delagoa Bay. October 1912. Collector, K. H. Barnard. One ♀, one ♂.

The specimens measure 30–130 mm. in dorsal mantle-length. The Zwart Kops example has lost the horny rings of the arms and tentacles. It is narrower than the other specimens and has some tubercles on the ventral surface. No. 63 has a mantle-length of 30 mm., the arm suckers are in 4 regular rows of about equal size; most of the rings are smooth, but some have 5–8 teeth on the distal border as found by Robson (1924, p. 640). The large rings of the club have about 18 teeth, and there are about 6 on the small rings. The male from Delagoa Bay (mantle, 68 mm.) also has teeth on the large tentacle rings, whilst in the female with mantle of 130 mm. they are smooth. It will probably be found that as in *S. singalensis*, Goodrich (Massy, 1916, p. 227), youthful specimens usually have the large tentacle rings denticulate, and that they lose this character when more grown. All the specimens have 2 suckers twice the size of their neighbours at the tip of club. As regards the size and position of the large suckers, they follow closely Robson's *op. cit.*, text-figure 23. The largest example alone shows the distinctive colour of light transverse bars on a darker background, but the other Delagoa Bay specimen has pink spots in transverse lines. No. 64 is faded and No. 63 has a much-abraded skin. The shells are all in bad condition. The last loculus, when examined microscopically, shows a delicate, coral-like, intersected pattern.

Distribution.—South Africa.

Rhombosepion australis (Quoy et Gaimard, 1832).

Sepia capense, d'Orb, 1834.

Sepia australis, E. A. Smith, 1917.

Rhombosepion capense, Robson, 1924.

P.F. 51. Cape St. Blaize, N. 42° E., mag. 11 m., shrimp trawl, 1–3½ f., sand shells. One ♀.

P.F. 2284. Mouth of Hout Bay, shrimp trawl, 40–50 f., fine sand. (?) Two ♀.

P.F. 8046. Cape Infanta, N.E. by N., 19 m., shrimp trawl, 46 f., sand and shingle. Two ♂, one ♀.

P.F. 99. Off Mossel Bay. Lat. $34^{\circ} 14'$ S. Long. $22^{\circ} 23'$ E., shrimp trawl, 36 f., mud. One ♂.

P.F. 6051. Off Sebastian Bay, Cape Infanta, E. by N. $\frac{3}{4}$ N., $4\frac{3}{4}$ m., shrimp trawl, 35 f., mud. One ♂, one ♀.

P.F. 2255. Lion's Head, N. 78 E., 12 m., shrimp trawl, 60 f., sand and small black specks. Two ♂.

P.F. 10,404. Gericke Point, N. by E. $\frac{1}{4}$ E., 5 m., shrimp trawl, 35 f., fine sand. One ♂, one ♀.

P.F. 7053. Sebastian Bluff, N.W. by W. $\frac{1}{4}$ W., $8\frac{1}{2}$ m., shrimp trawl, 34 f., mud. One ♂.

P.F. 15,577. Cape Point Lighthouse, W. $\frac{1}{4}$ S., $9\frac{1}{2}$ m., shrimp trawl, 32 f., fine sand. Three ♂, two ♀, 3 juv.

P.F. 2273. Hout Bay, shrimp trawl, 9-20 f., fine sand and brackish shingle. Two ♂, three ♀.

P.F. 1866. Cape St. Blaize, N., 36 m., shrimp trawl, 54 f., sand and shingle. Four ♀, two ♂.

P.F. 529. Algoa Bay. Lat. $33^{\circ} 52'$ S. Long. $25^{\circ} 48'$ E., shrimp trawl. One ♂.

P.F. 18,054. False Bay, near Roman Rock, shrimp trawl, 17-19 f., fine sand. One ♀.

This little species was given the name of *australis* or "Southern" by the old French naturalists who first found it in the far south latitude of the Agulhas Bank, off Cape Agulhas. Later writers were led by the name into regarding it as an Australian species, and specimens of a *Sepia* from Victoria and New South Wales have been named *S. australis*, Q. et G. Robson (1924, p. 643), with regard to this, says: ". . . from an examination of an undoubted example from New South Wales (British Museum), I cannot have any doubt that the Australian form is very distinct from the South African, although there are certain features in common." Robson, *op. cit.*, taking the view that *S. australis*, Q. et G. is an Australian species, gives the South African form the name of *R. capense*, and stresses the differences between the figures of Quoy and Gaimard and d'Orbigny and Férussac. That these figures, wonderful as they are, cannot be too closely relied upon is, I think, clear, particularly from the figure of the club of *S. australis* given by d'Orbigny (pl. xii).

In the present collection of 16 males and 16 females and 3 young, with dorsal mantle-length of 12-47 mm., considerable variation exists. A striking character by which the male can be picked out at once is the presence of an orange or purple streak which adorns either side of the dorsal mantle at the base of the fins. It seldom extends

farther than about half-way to the anterior margin. It is noteworthy that this is one of the characters given by Pfeffer for *S. venusta*.

The same streak is generally, but not invariably, absent in the female, and when present it is always less distinct than in the male. In small females it is faintly indicated by oval orange spots, but never forms a distinct line or band. The hectocotylus is well defined and affects the proximal three-fourths of the 4th left arm.

The proximal 4 or 5 suckers are normal and are succeeded by about 10 rows of very minute suckers. A sperm pad is moderately developed in the female. The dorsal mantle measures 36–39 mm. in the 6 largest males and 40–47 in the 6 largest females. The females are frequently a little broader in the centre than the male and sometimes have the fins approximated apically. In one haul of 4 females and 2 males all have the fins widely separated apically. In another haul consisting of 1 large female, 2 males, and 2 young (apparently female), all have the fins widely separated apically and are widest at centre of body. As regards the suckers, those of the arms agree with the description of d'Orbigny in being "très inégale en grosseur; celles du milieu plus grosses." Several specimens show a quite smooth ring, as found by Robson. Usually about 12 pointed teeth are present on the distal border. All the specimens which are in sufficiently good condition show about 12 long close-set, square-topped teeth on the distal margin of the large rings of the tentacular club, and about 8 similar shaped teeth placed wide apart are present on the small rings. All the examples have the purple ventral bands pointed out by Robson more or less clearly defined. The fins are usually broad and thin and without spots. The specimens Nos. 59* and 62† have narrower and thicker fins. The sculpture on the last loculus of the shell consists of fine undulating lines which are placed closer together than in *Doratosepion joubini* sp. nov. No. 62 has straighter lines in the last loculus than the other shells examined and fewer teeth on the arms and tentacle rings, but in its general appearance and the shape of club and the clear fins, it seems to be in close agreement with the other examples referred here to *R. australis*.

Distribution.—South Africa.

Rhombosepion hieronis, Robson, 1924.

P.F. 14,981. Lion's Head, S.E. $\frac{1}{2}$ E., 47 m., shrimp trawl, 175 f., green sand. One ♂. [19.]

* Cape St. Blaize.

† False Bay.

1261, No. 24. Lion's Head, S.E. $\frac{1}{4}$ E., 50 m., shrimp trawl, 230 f., green sand. Two ♀ and two young ♂.

P.F. 15,057. Lion's Head, S.E. $\frac{1}{4}$ S., 50 m., shrimp trawl, 230 f., green sand. One ♂ and two young. [58.]

These have a mantle-length of 6–29 mm. All have the ventral surface and fins almost entirely clear, the colour being condensed into a band of freckles on either side of fin base. The upper surface is uniformly reddish with a number of warts on the head and mantle. A large central tubercle surrounded by smaller ones is frequently present. The web extends about $\frac{1}{3}$ of the arms on the upper pairs. The buccal membrane is unusually high and much folded. It is without suckers. All the specimens have only 2 rows of suckers on the dorsal arms. Robson (1924, p. 646) notes this character only in the female. In the other arms the arrangement of the suckers is almost always in the following order, reading proximally to distally, second and third pairs, 2–3–2; fourth, 2–4–2. In a young specimen with mantle of 6 mm., the fourth arms read 2–4–2, and all the other arms 2. As observed by Robson, *op. cit.*, patches of much enlarged suckers occur on the second and third arms, as well as on the hectocotylised arm in the male. In the two largest males (Nos. 19 and 58) teeth are present on the distal border of the enlarged suckers wherever these occur. In the small males, mantle 11–12 mm., the hectocotylus is but little indicated, but the enlarged suckers of the lateral arms are very marked and their rings agree with the other suckers of the sessile arms in being smooth.

Distribution.—Cape Town, 112–150 f. (Type.)

Rhombosepion robsoni, sp. nov.

(Plate XVII.)

P.F. 2273. Hout Bay, shrimp trawl, 9–20 f., fine sand and shingle. One ♂.

This little creature bears a general resemblance to *R. hieronis*, Robson, but is distinguished from it by having grooved suckers (smooth rings) which are placed in 2 rows on all the arms, and none is enlarged in the male. They are very regular and relatively large, except distally where they are much reduced in size. The hectocotylus begins proximally and extends $\frac{3}{4}$ of the length of arm. A small sucker is on either margin with grooves between. As regards the club, about 53 stalked suckers are present and about 3 median rows have larger suckers than the rest. They are placed 4–6 in a row in the median

part. A papillary area is much developed, but teeth appear to be also present on part at least of the ring. The suckers are all much smaller than those of the arms, the largest equals in diameter a ring of a large arm sucker. The swimming membrane is large, and there are no chromatophores on it or on any other part of the club. In the specimens of all sizes referred in this paper to *R. hieronis* there are small chromatophores on the back of the club, and still smaller and darker ones usually form lines in the grooves on the back of the swimming membrane. Another colour difference between the two species is that the ventral surface has only a few freckles along the fin base instead of the mass of dark colour forming bands in this part in *R. hieronis*. Elsewhere the specimen is flesh-colour to pale brown and the surface is almost smooth. There are a few tubercles along the outline of the shell and on the head. The chromatophores are minute dark specks which extend partly on to the fins. The inner lip is papillose, the outer lip thin and smooth.

The buccal membrane is without suckers. The fins commence 3 mm. from the mantle-margin, and are wide and thin and separated by a space of 2 mm. The dorsal mantle-border is very slightly produced in the centre. Ventrally the mantle is deeply indented to receive the siphon. A very remarkable feature exists in the dorsal arms. The distal portions are thickened and end in rounded knobs without suckers. When observed laterally the surface is seen to be folded as if suckers might be in course of formation. The appearance may therefore be due to accident. In species of *Polypus* I have frequently seen arms in course of regeneration, but they were always much thinner and ended in curved points. The calcareous portion of the shell has unfortunately been totally dissolved, only the membranous part remaining.

Principal Measurements.

Dorsal mantle-length, 17 mm.

Dorsal mantle breadth at centre of body, including fins, 15 mm.

Breadth of head, 10 mm.

Club, 3 mm. × 2 mm.

	mm.		mm.
1st right arm,	10	1st left arm,	11
2nd „ „	11	2nd „ „	12
3rd „ „	11	3rd „ „	12
4th „ „	13	4th „ „	13

Rhombosepion sp. A.

P.F. 10,715. Cape Natal, W. by N., $6\frac{1}{2}$ m., shrimp trawl, 54 f., fine sand and algae. One ♂.

This resembles *R. hieronis*, Robson, very closely in general appearance, but the suckers of the arms have teeth on the distal border, and though a few suckers on the second and third right arms appear to be enlarged, this feature is not at all so marked as in almost similar sized males of that species, in which the suckers of all sizes as far as examined have smooth rings. The suckers are not grooved as in *R. robsoni*.

The order of suckers on the various arms reading proximally-distally is as follows:—First right, 2; second and third right, 2 (some enlarged); fourth right, 4—2 (obviously injured). First and second left arms, 2; third left, 2—3—2; fourth left, 2—0. The hectocotylus commences proximally and continues for $\frac{3}{4}$ of the arm, a minute sucker being placed on either margin with grooves between. Distally there are no suckers. The ventral bands of colour which are so distinct in *R. hieronis* are not present in this specimen. The colour of the dorsal mantle is reddish and there are many tubercles. The anterior mantle-margin is but little produced. The shell is, unfortunately, almost dissolved.

The principal measurements are as follows:—

	mm.		mm.
Dorsal mantle . . .	13	1st right arm . . .	5
Breadth	10	2nd and 3rd right . . .	7
Breadth of head . . .	7	4th right	8

Sepia (*Doratosepion*) *joubini*, sp. nov.

(Plate XVIII.)

P.F. 11,741. Tugela River mouth, N.W. by N. $\frac{3}{4}$ N., $15\frac{1}{2}$ m., shrimp trawl, 36—42 f., mud. One ♀.

P.F. 10,715. Cape Natal, W. by N., $6\frac{1}{2}$ m., shrimp trawl, 54 f., fine sand and algae. Two ♂, one ♀.

The most remarkable feature of this species is that the lateral arms of the female, and to a lesser extent those of the male, are extremely narrow and terminate in stiff lash-like ends. The arms are semi-equal, the dorsal the shortest, and the lateral perhaps the longest, but the measurements given must be regarded as only approximate. All have protective membranes with transverse strengthening bands.

The dorsal arms of the large female have the suckers on long stalks and in 4 irregular rows, except proximally where there are fewer in a row. The distal $\frac{1}{3}$ of arm has a median canal with the suckers arranged in pairs on either side. The lateral arms have the suckers placed 2 in a row for about 6 proximal rows, they are then placed 4 in a row with a space in the centre, and distally for almost $\frac{1}{2}$ of the arm they are suddenly reduced in size and are placed 2 in a row, one on either side of arm with a deep canal between. These minute suckers are pale in colour and resemble seed pearls. The suckers of all the arms are smooth as far as examined. The web is carried to the point where the arms are suddenly reduced in size and number. The fourth pair of arms are mutilated. The proximal suckers are scattered thinly and are succeeded by suckers placed 4 in a row. In the other female these arms possess suckers placed 4 in a row to the tip, but on the distal $\frac{1}{3}$ they are very small and placed in pairs on either side of a deep groove.

The tentacular club has 4 suckers much enlarged and with teeth or irregular notches all round the ring. The smaller rings sometimes have teeth all round the ring and often only about 8 are present.

In the largest male the dorsal arms have the suckers placed 4 in a row to the tip where they are very minute. The lateral pairs have the suckers 4 in a row, except distally where they are placed 2 in a row and are very minute, but without the canal which is so marked in the female, and the arms are not so narrow and lash-like. The fourth right arm has large irregular proximal suckers succeeded by 4 in a row of much smaller size, and distally the suckers become very minute, but appear to be in 4 rows to the tip of arm. The hectocotylus on the fourth left arm is rather obscure.* It is situated on the distal $\frac{1}{2}$ of arm where the suckers on the dorsal border become more minute and are separated considerably from the ventral suckers which are reduced to a single row. This arrangement persists for about 6 rows. The distal portion has minute suckers placed 4 in a row. The males have a mantle-length of 33–40 mm., and the same measurement in the females is 36–47 mm. The width of the largest female at the centre of the body, including fins, is 23 mm. The fins commence in this specimen at 3 mm. from the mantle-margin and are widest posteriorly. They are clear above and below. All the specimens are flesh-colour to cinnamon and have an almost smooth surface. A few tubercles are present on the dorsal mantle and head and along the fin margin. Some oblong red markings are present on the dorsal mantle and

* In the other male many suckers are missing on this arm.

reddish patches occur between the eyes. There is also a slight sprinkling of minute dark chromatophores on the mantle. The inner lip is thick and papillose, and the outer lip is thinner and smooth. There are no suckers on the buccal membrane and in the female a sperm pad is not developed, the space between the ventral arms being merely a little deeper. In the largest female the nidamental glands measure 8×5 mm., and in the smaller example they measure 6×3 mm. and are placed much farther from the arms. The shells of all the specimens are unfortunately in very soft condition. Those of a male and female were examined and proved to be of the usual *Doratosepion* type with a spine. The ventral surface of both shows a rounded outline of the striated area, and on the last loculus a beautiful pattern of wavy lines becomes apparent when examined microscopically. The chitinous margin is pale horn colour.

Principal Measurements.

	P.F. 11, 741 ♀ mm.	P.F. 10, 715 ♀ mm.	♂ mm.	♂ mm.
Dorsal mantle-length . . .	47	36	40	33
Dorsal mantle breadth, including fins . . .	23	18	16	15
Breadth of head . . .	13	11	12	12
1st right arm . . .	15	14	16	mutil.
2nd „ „ . . .	21	17	15	„
3rd „ „ . . .	18	17	16	13
4th „ „ . . .	mutil.	14	18	15
Tentacle . . .	35	46	mutil.	40
Club . . .	6	5	..	4

Sepia sp.

P.F. 10,440. Cape St. Blaize, N. $7\frac{1}{2}$ m., large dredge, 37 f., fine sand. One juv.

This is a hard dried-up specimen with mantle-length of 10 mm. The arm suckers are in 2 rows and the suckers of the club are all small.

Sepia sp.

P.F. 754. Buffalo River, 2 miles above jetty, small shrimp nets, mud. One juv.

This is in very bad condition. The dorsal mantle-length measures 12 mm. The arm suckers are in 4 rows and appear to have smooth rings, but they are very minute. The tentacle club measured 3 mm. in length, and had some suckers larger than the rest, apparently with

smooth rings. The shell has dissolved, but its impression shows that it had a spine and a rounded striated area.

Sepia sp.

P.F. 7072. Cape Infanta, N.N.W., 4 m., tow net. Three.

These appear to be different stages of the same species and have a mantle-length measuring from 2.50–7 mm. All have large dark-red chromatophores which are larger and rounder on the ventral surface. The fins, which commence at about 1.50 mm. from mantle-margin in the largest specimen, are clear, as is also the siphon in the youngest. The next largest has chromatophores on the sides of siphon, and in the most developed specimen they cover its visible surface.

The arm suckers appear to be in 2 rows, and the tentacular clubs have 2 or 3 suckers much larger than the others.

Hemisepius typicus, Stn., 1875.

P.F. 3046. False Bay, Roman Rock, N.W. $\frac{3}{4}$ N., $\frac{3}{4}$ m., large dredge, 18 f., sand and rough shingle. One ♂.

P.F. 2273. Hout Bay, shrimp trawl, 9.20 f., fine sand and brackish shingle. Two ♂.

Steenstrup got the type from Table Bay, Cape Town (Capt. Andréa). It was next taken by the Scottish National Antarctic Expedition (Hoyle, 1904) at Saldanha Bay, Cape Colony, two females being trawled at 8–10 fathoms. The Valdivia Expedition procured the first male, of which the hectocotylus on the fourth left arm was figured by Chun (1915, p. 412, fig. 34). A small female was caught at the same place, namely, the shallow water of Francis Bay, a north part of the Agulhas Bank. Chun remarked that from this it would appear that the genus is tolerably restricted in its distribution. The present examples do not extend the distribution materially, but show that the species is evidently present in shallow water all along the coast from Saldanha Bay to Cape Agulhas. The principal measurements of the specimen from False Bay, are given below.

	mm.		mm.
Dorsal mantle-length	21	Breadth of mantle and fins	22
Breadth of head	12		
1st right arm	12	1st left arm	11
2nd ,,	13	2nd ,,	13
3rd ,,	15	3rd ,,	15
4th ,,	15	4th ,,	14

OCTOPODA.

FAMILY POLYPODIDAE.

Subfamily OCTOPODINAE.

Bathypolypus valdiviae (Chun, 1915).

P.F. 18,162. Cape Point, N.E. by E. $\frac{3}{4}$ E., 28 m., shrimp trawl, 300 f., fine sand. One ♂.

This fine specimen, which is preserved in alcohol, is reddish brown above and paler below. The web is very delicate and almost transparent. It extends about $\frac{1}{3}$ up the arms and is slightly higher laterally than dorsally and lowest ventrally. The body is of very soft consistency. The dorsal surface of the head, body, and web is densely covered with large and small tubercles. The end of the body appears to be smooth, but small tubercles become visible on examination with a lens. A peripheral keel is present. The suckers of the arms are very minute and average 1 mm. in diameter. The modified portion of the hectocotylised arm measures 8×5 mm. and has a pointed tip and 5 transverse ridges.

Principal Measurements.

	mm.		mm.
Head across eyes	30	1st right arm	62
Breadth of body	32	2nd ,, ,,	60
Ventral mantle-length	27	3rd ,, ,, (hect.)	45
		4th ,, ,,	59

Distribution.—500 m., Agulhas Bank, $35^{\circ} 10.5' S.$, $23^{\circ} 2' E.$, type. (Chun, 1915.)

Polypus granulatus (Lam., 1799).

P.F. 16,022. Seal Island, S.S.W., $\frac{1}{2}$ m. False Bay, dredge, 11 f., brackish shingle. (?) One young.

P.F. 871. About 23 m. E. of East London. Lat. $32^{\circ} 48' 30'' S.$ Long. $28^{\circ} 14' 30'' E.$, large trawl, 24–27 f., mud and sand. One ♀.

Board of Agriculture, Cape Colony. One ♀. [1311 D.]

The young specimen has a mantle-length of only 11 mm. and is paler than older specimens of *P. granulatus*. It is very rough skinned and has a large cirrus inside each eye and at the end of body. The lateral arms are the largest and measure about $2\frac{1}{2}$ times the length of the body. The web is lowest dorsally.

The principal measurements of the example 1311 D are given below.

	mm.		mm.
Ventral mantle .	19	Breadth of body .	24
End of body to eye	28	Diameter largest sucker	3
1st right arm .	56	1st left arm .	65
2nd ,, ,, .	mutil.	2nd ,, ,, .	mutil.
3rd ,, ,, .	79	3rd ,, ,, .	81
4th ,, ,, .	mutil.	4th ,, ,, .	mutil.

Distribution.—Azores to Cape, Indian Ocean, Pacific.

Polypus sp.

P.F. 16,022. Seal Island, S.S.W., $\frac{1}{2}$ m. False Bay, dredge, 11 f., brackish shingle. One.

The above is a small rough-skinned specimen with a ventral mantle-length of 11 mm. The lateral arms are the largest and the web is lowest dorsally. There is a very prominent tubercle at the end of the body and cirri about the eyes. It is perhaps a young example of *P. granulatus* (Lam.), but is paler than older specimens.

Polypus sp.

P.F. 858. Off E. of Cape Morgan. Lat. 32° 45' 45" S. Long. 2°. One young.

This has a ventral mantle measuring 2.50 mm. in length, the general colour is pale greenish with minute dark specks, and large dark chromatophores occur on the back of the arms. These measure about 3 times the length of the body and are longest laterally. Surface smooth, except in the neighbourhood of the eyes where there are numerous granules.

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EXPLANATION OF PLATES.

PLATE XVII.

Rhombosepion robsoni, sp. nov. ♂.

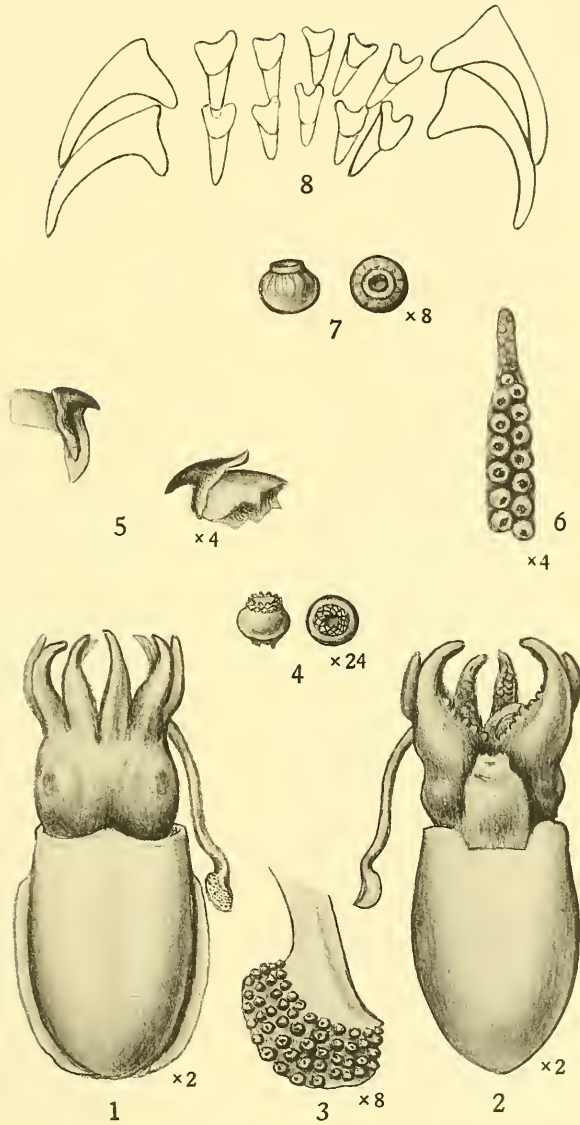
FIG.

1. Dorsal aspect. ×2.
2. Ventral aspect. ×2.
3. Club of tentacle. ×8.
4. A club sucker. ×24.
5. Mandibles. ×4.
6. A lateral arm. ×4.
7. An arm sucker. ×8.
8. Radula (much enlarged).

PLATE XVIII.

Doratosepion joubini, sp. nov. ♀.

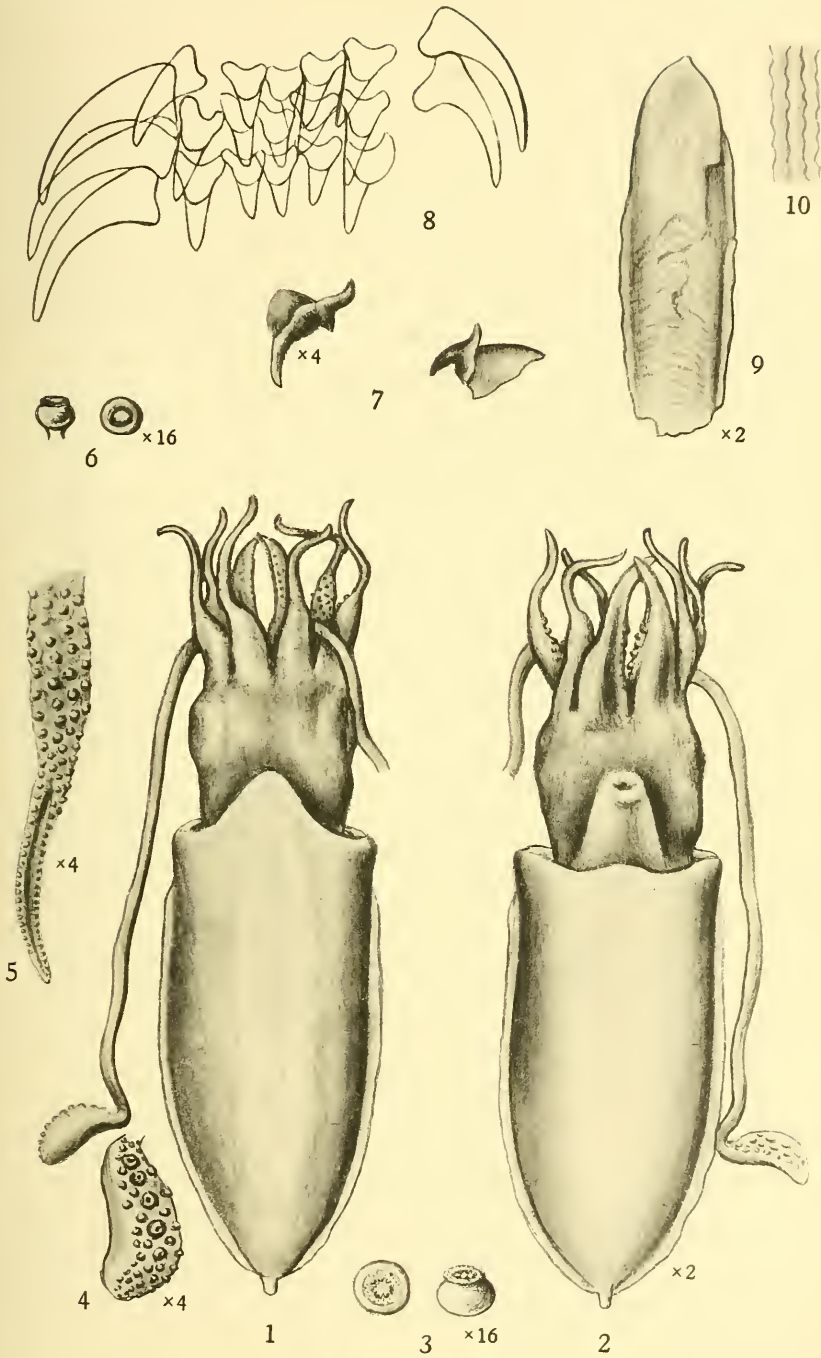
1. Dorsal aspect. ×2.
2. Ventral aspect. ×2.
3. A club sucker. ×16.
4. Club of tentacle. ×4.
5. A lateral arm. ×4.
6. An arm sucker. ×16.
7. Mandibles. ×4.
8. Radula (much enlarged).
9. Shell, ventral aspect. ×2.
10. Sculpture of shell on unstriated area, much enlarged.



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